OUTBREAK SPOTLIGHT….

Outbreak Spotlight is a regularly occurring feature in the *Indiana Epidemiology Newsletter*. The event described below highlights the collaboration of different local health departments investigating an outbreak that crosses county and district borders.

A Joint Effort
Outbreak of Gastroenteritis in Jackson County

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Background

On April 12, 2004, a representative of the Jackson County Health Department notified the Indiana State Department of Health (ISDH) that several students and staff members from a Jennings County school had developed symptoms of gastroenteritis, characterized primarily by vomiting and diarrhea, after eating lunch at a Jackson County restaurant on April 12. Approximately 23 students and school staff ate at the restaurant.

Epidemiologic Investigation

The ISDH, the Jackson County Health Department, and the Jennings County Health Department initiated a collaborative investigation. A study was conducted in order to describe the outbreak and to determine whether the source may have been food-related. The ISDH developed a questionnaire that documented illness history and foods eaten at the restaurant. Since those affected were residents of Jennings County, the Jennings County Health Department distributed the questionnaire to the school group members who ate lunch at the restaurant. Completed questionnaires were returned to the Jennings County Health Department and forwarded to the ISDH Epidemiology Resource Center for analysis. A case was defined as any previously healthy person attending the lunch who became ill with diarrhea and/or vomiting on or after April 12. Anyone who attended the lunch and was well before and after April 12 was included as a control. Any person who was ill for any reason during the week before April 12, or who became ill with symptoms that did not include diarrhea and/or vomiting, was excluded from the study.

Twenty-three people attended the lunch, with 19 of the attendees reporting that they became ill. Thirteen people met the case definition. Four people were identified as controls. Symptoms reported by the 13 cases included: vomiting (85%), cramps (85%), nausea (69%), headache (69%), and fatigue (61%). Other symptoms reported included diarrhea, body aches and chills. The median duration of illness was 19 hours (range: 2.0 hours to 36.0 hours). None of the cases sought medical attention. No stool specimens were available for laboratory analysis. The median incubation period of illness was 1.5 hours (range: 0.50 hours to 2.5 hours).

School group members all atefrom a lunch buffet and did not order from the menu. They arrived at the restaurant at 11:50 a.m. and left at approximately 1:15 p.m. According to the restaurant manager, over 100 meals were served during lunch. Other than the school group, no other patrons reported illness to the local health departments or to the restaurant.

Due to the limited number of controls, statistical analysis could not be performed. Many of the individuals stated that the ice cream tasted unusual; however, there was no conclusive evidence that ice cream was associated with illness.

Environmental Assessment

Since the restaurant in question was located in Jackson County, representatives from the Jackson County Health Department inspected the restaurant on April 12 to review food preparation practices, collect leftover samples, and inquire about employee illness. Lunch buffet food samples were not available. However, several food samples from the evening buffet were available (see "Laboratory Analysis"). None of the employees reported having been ill. No employee had open cuts or wounds, although one line cook had a burn on the top side of the arm in the elbow area.

Temperatures of several products on the buffet were checked. Cucumbers measured 55°F, seafood salad 58°F, stuffed mushrooms 118°F, chicken on a stick 124°F, chicken and broccoli 123°F, chicken wings 118°F, roasted chicken 130°F, spicy chicken 102°F, and rice 158°F. Water in the steam units measured 200°F. According to the Indiana Retail Food Establishment Sanitation Requirements, Section 173, hot foods must be maintained at 140°F or above and cold foods at 41°F or below.

The ice cream dispenser is taken apart every night and washed in the dish machine. The ice cream mix is a non-dairy product mixed with cold water. Soft drink machines have aluminum fittings. Temperatures in the walk-in refrigerators measured 28°F and 25°F, and the freezer temperature measured -7°F.

Laboratory Results

No stool specimens were available for laboratory analysis. Several food samples were submitted to the ISDH Laboratories for analysis. The sample of ice cream had a slightly elevated aerobic plate count and coliform count, but tested within normal limits for *E. coli*, *Staphylococcus aureus*, and *Bacillus cereus*. Other samples tested within normal limits.

Conclusions

This investigation confirms that an outbreak of gastroenteritis occurred following a lunch outing at a Jackson County restaurant. Given that the only timely common factor among all ill individuals was eating lunch at the restaurant, transmission most likely occurred at this establishment. The individuals did not share any other common food items, nor was there a similar illness circulating in the school or the community at the time.

In the absence of laboratory results, it is impossible to conclusively identify the causative agent of this outbreak. However, the clinical syndrome is most compatible with *Staphylococcus aureus*. The symptoms experienced (vomiting and nausea) and incubation period (median 1.5 hours) are typical of staphylococcal infection. No specific food vehicle responsible for disease transmission was identified. However, the ice cream sample did show slightly elevated aerobic plate and coliform counts, which may be attributed to mishandling. Although the

ice cream tested negative for the presence of *Staphylococcus aureus* bacteria, it is not uncommon for bacteria to be unevenly distributed in food. Staphylococcal enterotoxin testing was not performed.

Staphylococci are usually introduced into food when a food handler touches the nose, mouth, an open sore, or used handkerchief or tissue and then prepares food with inadequately washed hands. Once present in the food, the organisms can multiply rapidly under optimal temperatures and produce a heat-stable enterotoxin, which is not inactivated by subsequent cooking. However, staphylococcal foodborne disease can be prevented if food is prepared and stored properly. The optimal temperature range for growth of *Staphylococcus aureus* is 68°F to 99°F. This temperature range is achieved if hot or cold foods reach room temperature prior to or during serving. The environmental assessment noted that hot foods on the buffet were not maintained at or above 140°F, and cold foods were not maintained at or below 41°F. Hot and cold foods should be maintained at proper temperatures and temperatures monitored if not immediately consumed.

In general, most outbreaks of *Staphylococcus aureus* can be prevented by strictly adhering to the following food safety practices:

1. Ensure that anyone who handles food uses good hand-washing practices.
2. Use gloves or utensils to handle food, rather than bare hands.
3. Maintain hot foods at 140°F or above; maintain cold foods at 41°F or below.
4. Regularly monitor food temperatures.